

## **REMARKS**

Claims 1-20 are pending, with claims 15-20 withdrawn from consideration and claims 1-14 under current examination.

### **Regarding the Final Office Action:**

In the Final Office Action, the Examiner rejected claims 1-4 and 10-12 under 35 U.S.C. § 103(a) as being unpatentable over Tanaka (U.S. Patent No. 6,906,374) in view of Matsuoka et al. (U.S. Patent No. 6,809,364, hereinafter “Matsuoka”); and rejected claims 6-9 under 35 U.S.C. § 103(a) as being unpatentable over Tanaka in view of Matsuoka and further in view of Nguyen et al. (U.S. Publication No. 2004/0092095, hereinafter “Nguyen”). The Examiner indicated that claims 5, 13, and 14 are drawn to allowable subject matter, and would be allowed if rewritten in independent form. Applicant traverses the rejections for the following reasons.<sup>1</sup>

Applicant incorporates herein by reference the arguments made in the Request for Reconsideration after Final, filed on October 24, 2005.

### **Regarding the Advisory Action:**

In the Advisory Action, mailed November 8, 2005, the Examiner addressed Applicant's arguments made in the Request for Reconsideration after Final, filed on October 24, 2005.

Specifically, the Examiner alleged

that in Fig. 34, the center element 54 is not relied on for teaching as a ‘guard ring’ as asserted by Applicant, but rather, the rightmost element 54 is relied on for teaching as a ‘guard ring’ as claimed. There are differences between the center element 54 and the rightmost element 54. The center element 54 functions as a capacitor lower electrode because it is connected to the transistor through the contact plug 44. However, the rightmost element 54 functions as ‘a guard ring’ (column 11, lines 35-38), and it does not function as capacitor lower electrode as asserted by Applicant because it is in an electrically floating state, it

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<sup>1</sup> The Office Action may contain statements characterizing the related art, case law, and claims. Regardless of whether any such statements are specifically identified herein, Applicant declines to automatically subscribe to any statements in the Office Action.

does not connect anywhere in the circuitry. Therefore, the rightmost element 54 is a 'guard ring ... electrically insulated from ... said MIM capacitor.'

**Rejection of Claims 1-4 and 10-12 under 35 U.S.C. § 103(a):**

Applicant traverses the rejection of claims 1-4 and 10-12 under 35 U.S.C. § 103(a) as being unpatentable over Tanaka in view of Matsuoka. Applicant respectfully disagrees with the Examiner's arguments and conclusions. A *prima facie* case of obviousness has not been established.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). M.P.E.P. § 2142, 8th Ed., Rev. 3 (August 2005), p. 2100-134.

A *prima facie* case of obviousness has not been established because, among other things, neither Tanaka nor Matsuoka, nor their combination, teaches or suggests each and every element of Applicant's claims.

In the Advisory Action, the Examiner apparently took the position that Tanaka, col. 11, lines 35-38, defines the portion of metal film 54 at the boundary between the DRAM memory cell region and the DRAM peripheral circuit region as a "guard ring." See Tanaka, Fig. 34. Fig. 34 apparently shows the rightmost lower electrode 54 being electrically insulated from the rest of the structures in Fig. 34, being surrounded on all sides by insulating films 56, 48, 46, and 42. The Examiner alleged that Tanaka teaches a "MIM capacitor having a lower metal electrode 54 or 11 (Fig. 1) (column 6, lines 15-16) and an upper metal electrode 58 (column 13, lines 47-50),

and formed above the first insulating film 36/32; a second insulating film 48 formed to cover the MIM capacitor” (Final Office Action, p. 2).

However, an examination of Tanaka, particularly Fig. 34, reveals that second insulating film 48 does not cover the capacitor structure (lower electrode 54 / insulation film 56 / upper electrode 58). Rather, the second insulating film 48 is formed adjacent to lower electrode 54 and underneath upper electrode 58. Thus, Tanaka does not teach or suggest Applicant’s claimed “second insulating film formed to cover said MIM capacitor” (claim 1, emphasis added).

In addition, the Examiner apparently concedes that Matsuoka fails to teach or suggest the claimed “guard ring,” and relies on the Matsuoka only to teach a second wiring. Final Office Action, p. 3. Accordingly, the Examiner’s proposed combination of Tanaka and Matsuoka also fails to teach at least the claimed electrically insulated “guard ring,” recited in claim 1.

In addition, the Examiner has not established the requisite motivation necessary to combine Tanaka and Matsuoka. The Federal Circuit has noted that “virtually all [inventions] are combinations of old elements.” *See e.g., In re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457 (Fed. Cir. 1998) (internal citations omitted). The Federal Circuit has explained that an Examiner may find every element of a claimed invention in the prior art, but mere identification is not sufficient to negate patentability. *See Id.* The court explained that “the examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed.” *Id.*

Also, determinations of obviousness must be supported by evidence on the record. *See In re Zurko*, 258 F.3d 1379, 1386 (Fed. Cir. 2001), 59 USPQ2d 1693, 1696-98 (finding that the factual determinations central to the issue of patentability, including conclusions of obviousness

by the Board, must be supported by “substantial evidence”). The desire to combine or modify references must be proved with “substantial evidence” that is a result of a “thorough and searching” factual inquiry. *See In re Lee*, 277 F.3d 1338, 1343-1344 (Fed. Cir. 2002), 61 USPQ2d 1430, 1433 (quoting *McGinley v. Franklin Sports, Inc.*, 262 F.3d 1339, 1351-52). Additionally, the Federal Circuit has clearly stated that the evidence of a motivation or suggestion to modify a reference must be “clear and particular.” *In re Dembicziak*, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999).

In this case, the Office Action does not show that a skilled artisan considering Tanaka and Matsuoka, and not having the benefit of Applicant’s disclosure, would have been motivated to combine the references in a manner resulting in Applicant’s claimed combination. The Examiner merely provided descriptions of how the references allegedly teach certain features without providing “clear and particular” reasons why a skilled artisan “would select the elements from the cited prior art references for combination in the manner claimed.” *See In re Dembicziak*, 175 F.3d at 999, 50 USPQ2d at 1617; *In re Rouffet*, 149 F.3d at 1357, 47 USPQ2d at 1457.

For example, the Examiner alleged “it would have been obvious to form a second wiring on the second insulating film of Tanaka because as taught by Matsuoka, such forming of the second wiring layer would provide an additional wiring layer desired for the semiconductor device (column 8, lines 52-56)” (Final Office Action, p. 3). The Examiner has not shown that one of ordinary skill in the art would have been motivated to combine Tanaka and Matsuoka, viewing only teachings from within these references themselves, in a manner resulting in Applicant’s claimed invention.

The fact that Matsuoka states that “naturally, additional wiring layers can be formed in the semiconductor storage device when necessary” (col. 8, lines 54-56) does not constitute a motivation for one of ordinary skill in the art to combine Tanaka and Matsuoka. The respective structures of Tanaka’s and Matsuoka’s devices do not lend themselves to combination, and if combined, do not produce the claimed invention. For example, Matsuoka’s wiring lines 26 are only connected to the *peripheral transistor* via layers 25, 21, and 19, and are not related to the *memory capacitors* 23 in any way. See Matsuoka’s Fig. 22. Any additional wiring lines in Tanaka, however, cannot be formed on the structure shown in Fig. 34 without interfering with the trench capacitor’s upper electrode 58.

Therefore, a *prima facie* obviousness also has not been established, for at least the reason that the requisite motivation to modify Tanaka and Matsuoka, from within the references themselves, is lacking. In the rejection, the Examiner has not shown that one of ordinary skill in the art, when considering Tanaka and Matsuoka, and not having the benefit of Applicant’s disclosure, would have been motivated to modify and/or combine these references in a manner resulting in Applicant’s claimed invention. The Examiner’s allegation of motivation is specious at best, and does not explain how one of ordinary skill in the art would have modified Tanaka and Matsuoka to produce all the elements of independent claim 1. The clear differences in the structures of Tanaka and Matsuoka, discussed above, demonstrate that they are not combinable. Moreover, the apparent ability to form additional wiring layers “when necessary” (according to Matsuoka) is not determinative of whether one of ordinary skill in the art would have been motivated to combine the references.

Applicant also directs the Examiner’s attention to M.P.E.P. § 2143.01, which makes clear that: “[t]he mere fact that references can be combined or modified does not render the resultant

combination obvious unless the prior art also suggests the desirability of the combination” (citations omitted). The Examiner has not shown that Tanaka and Matsuoka “suggests the desirability” of their combination, whether or not additional wiring layers are formed. Thus, there would have been no motivation to combine these references. For at least these additional reasons, a *prima facie* obviousness has not been established regarding independent claim 1.

Applicant also notes that “[i]n determining the differences between the prior art and the claims, the question under 35 U.S.C. § 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious. M.P.E.P. § 2141.02 (citing *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 218 USPQ 871 (Fed. Cir. 1983); *Schenck v. Nortron Corp.*, 713 F.2d 782, 218 USPQ 698 (Fed. Cir. 1983)). Here, the Examiner has not shown that independent claims 1 and 10, as a whole, would have been obvious in view of Tanaka and Matsuoka.

For at least these additional reasons, *prima facie* obviousness of independent claim 1 has not been established. Independent claim 1 is therefore allowable, for the reasons argued above, and dependent claims 2-4 and 10-12 are also allowable at least by virtue of their respective dependence from allowable base claim 1. Therefore, Applicant requests that the improper 35 U.S.C. § 103(a) rejection be withdrawn.

**Rejection of Claims 6-9 under 35 U.S.C. § 103(a):**

Applicant traverses the rejection of claims 6-9 under 35 U.S.C. § 103(a) as being unpatentable over Tanaka and Matsuoka in view of Nguyen. Applicant respectfully disagrees with the Examiner’s arguments and conclusions. A *prima facie* case of obviousness has not been established.

Applicant has already demonstrated in the previous section that Tanaka and Matsuoka, taken alone or in combination, fail to teach or suggest all the elements of independent claim 1.

The Examiner's application of Nguyen, however, for its "forming of an insulating film 104 surrounding an interconnect and made of materials including fluorine containing silicon oxide (FSG), carbon containing silicon oxide (SiOC), or porous silicon oxide" (Office Action, p. 4), fails to cure the deficiencies of Tanaka and Matsuoka already discussed. Nguyen is drawn to a "pre-liner and liner," but also fails to teach the "guard ring," recited in claim 1 and required by dependent claims 6-9. *See Nguyen*, col. 2, par. [0002].

Thus, even if Nguyen were combined with Tanaka and Matsuoka, as the Examiner suggests, Nguyen does not cure their deficiencies and does not teach or suggest all elements recited in independent claim 1 and required by dependent claims 6-9. Therefore, the Examiner's application of Nguyen as an additional reference does not establish *prima facie* obviousness of Applicant's dependent claims 6-9.

Applicant has therefore established that the cited references, taken alone or in combination, do not teach or suggest each and every element of independent claim 1. Accordingly, the Examiner's reliance on the cited references fails to establish *prima facie* obviousness of dependent claims 6-9. Dependent claims 6-9 are allowable at least by virtue of their respective dependence from allowable base claim 1. The improper 35 U.S.C. § 103(a) rejection should be withdrawn.

**Objected-to Claims 5, 13, and 14:**

Since Applicant has demonstrated above that independent claim 1 is allowable, dependent claims 5, 13, and 14 are also allowable at least by virtue of their respective dependence from allowable base claim 1. Applicant requests withdrawal of the objection.

**Conclusion:**

In view of the foregoing, Applicant requests reconsideration of the application. Pending claims 1-14 are in condition for allowance, and Applicant requests a favorable action.

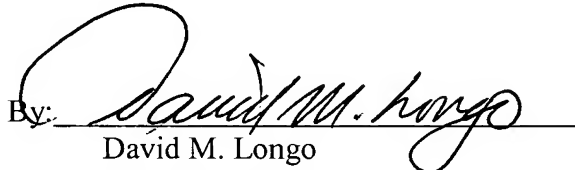
If there are any remaining issues or misunderstandings, Applicant requests the Examiner telephone the undersigned representative to discuss them.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,  
GARRETT & DUNNER, L.L.P.

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By:   
David M. Longo  
Reg. No. 53,235

/direct telephone: (202) 408-4489/